

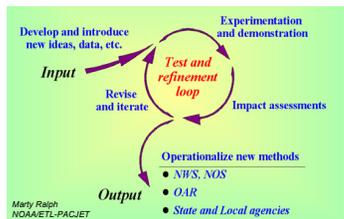
# Establishing a National Hydrometeorological Testbed Program

Marty Ralph, David Kingsmill, Brooks Martner, Albin Gasiewski (NOAA/OAR/ETL)

Other NOAA partners include OAR(NSSL,CDC,FSL,AOML), NWS(OHD,HPC,NOHRSC,WR,ER,EMC), NESDIS(ORA)

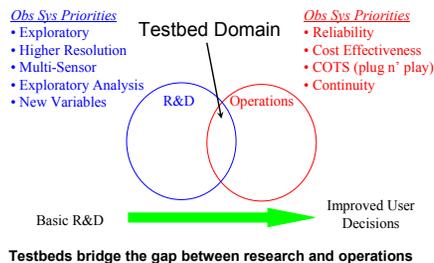
## Overarching Objective: Advance Water Resources Data Assimilation

### Testbed Concept

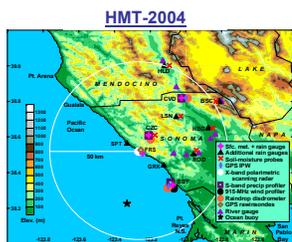


In a testbed, new ideas can be demonstrated and their impacts assessed through a refinement loop approach.

### Testbed Motivation

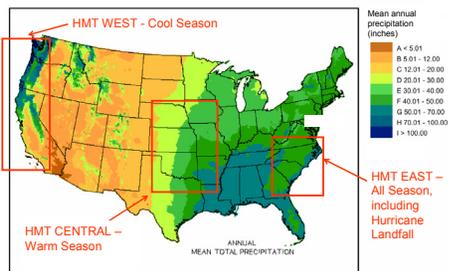


### Prototype Hydrometeorological Testbed (HMT)



The basemap shows the locations of operational and research observing systems in place for HMT-2004, which focused on the Russian River watershed.

### Regional Implementation Strategy

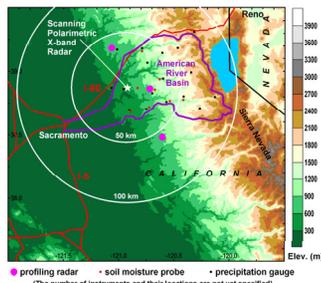


The national Hydrometeorological Testbed program will be implemented incrementally in different regions of the U.S.

A national Hydrometeorological Testbed (HMT) program with a regional implementation strategy is being developed in NOAA for the purpose of advancing water resources data assimilation. The general strategy of this effort is to conduct research and development to deploy advanced systems for observed information to support critical decision making and fresh/salt water forecasting. More specifically, high resolution atmospheric and hydrometeorologic observations (precipitation, soil moisture, snowpack, winds, temperature, moisture) will be collected and analyzed for several key water resource applications such as distributed hydrologic model validation, quantitative precipitation forecast (QPF) and estimation (QPE) validation, and improved understanding of key physical processes.

### HMT-WEST:

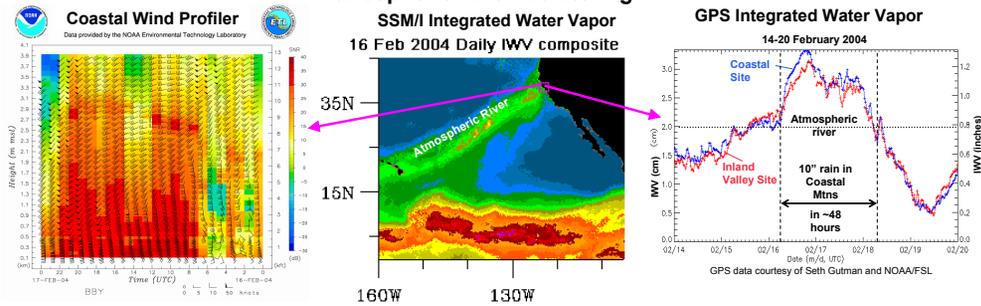
#### American River Basin 2005-2008



The first full implementation of HMT will be in the west, with a focus on the American River Basin during cool season's 2005 to 2008.

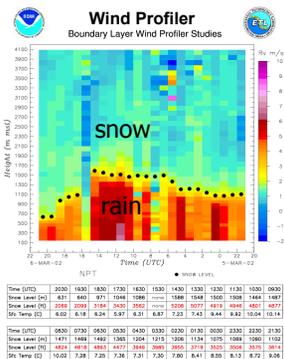
## Observing System Demonstrations for Hydrometeorological Applications

### Atmospheric River Monitoring:



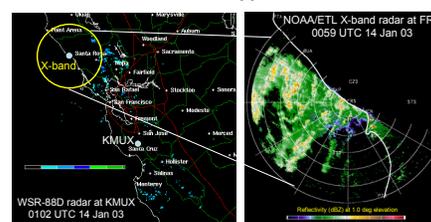
The atmospheric river shown in the SSM/I satellite image was observed in high time resolution (30-60 min), with a coastal wind profiler and two GPS integrated water vapor sensors deployed in the HMT-2004 network. The strong winds and enhanced moisture content within the river produced flooding rains in the coastal mountains.

### Snow level detection



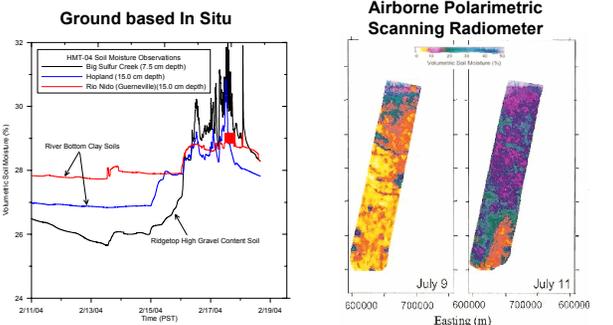
Hourly snow levels (black dots) superimposed on profiles of Doppler vertical velocity. This snow level product was made available to forecasters and end users in real-time through the internet.

### Filling Gaps in Operational Radar Coverage



The nearest WSR-88D radar does not see the significant echoes approaching a flood-prone watershed observed by the gap-filling radar

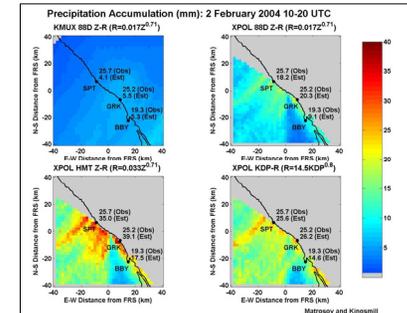
### Soil Moisture Mapping



Contrasting soil moisture time series from ground based in situ sensors for the flood case shown above

Patterns of volumetric soil moisture content measured by airborne polarimetric scanning radiometer over central Oklahoma.

### Quantitative Precipitation Estimation



Rainfall estimates from specific differential propagation phase information (KDP) provide the best match with surface raingauge data.